Status of the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1 - 18 (cancelled).

19. (previously presented) A method, comprising:

using first and second probes each having a respective elongated nozzle;

scanning the first probe over a reference surface to produce successive reference values, such that a size of an opening of the elongated nozzle allows for an entire area of the reference surface adjacent the first probe during the scanning to be measured by substantially eliminating low sensitivity areas;

scanning the second probe over a measured surface to produce successive measured values, such that a size of an opening of the elongated nozzle allows for an entire area of the measured surface adjacent the second probe during the scanning to be measured by substantially eliminating low sensitivity areas; and

determining a topography of the measured surface based on a difference between respective ones of the successive measured values and respective ones of the successive reference values.

20. (Previously Presented) The method of claim 19, further comprising:

producing a uniform sensitivity footprint based on the shape and size of the opening of the elongated nozzle.

21. (previously presented) The method of claim 19, further comprising:

using the respective elongated nozzles having a width to length ratio of about 2:1.

22. (previously presented) The method of claim 19, further comprising:

using the respective elongated nozzles having a width to length ratio of about 10:1.

23. (previously presented) The method of claim 19, further comprising:

using the respective elongated nozzles having a width to length ratio of about 20:1.

24. (previously presented) The method of claim 19, further comprising:

using the respective elongated nozzles having a width to length ratio of between about 2:1 to about 20:1.

25. (previously presented) The method of claim 19, further comprising:

using a flat metal plate on or adjacent a substrate stage that holds a substrate as the reference surface; and

using the substrate stage or the substrate as the measured surface.

26. (previously presented) A gas gauge proximity sensor that is provided with a gas supply during operation, comprising:

a dividing portion that divides the supplied gas into a reference channel and a measurement channel;

flow restrictors located in the reference channel and measurement channel;

reference and measurement probes respectively coupled to adjacent ends of the reference channel and the measurement channel, the reference and measurement probes including elongated nozzle orifices; and

a mass flow sensor coupled between the reference and measurement channels that senses the mass of gas flow therebetween.

27. (previously presented) The gas gauge proximity sensor of claim 26, further comprising:

a reference surface located a reference standoff from the reference probe, wherein a reference gas stream from the reference probe impinges on the reference surface after traveling across the reference standoff; and

a measurement surface located a measurement standoff from the measurement probe, wherein a measurement gas stream from the measurement probe impinges on the measurement surface after traveling across the measurement standoff,

wherein the mass flow sensor senses a difference between the reference standoff and the measurement standoff.

28. (previously presented) The system of claim 26, further comprising:

a mass flow rate controller located before the dividing portion.

29. (previously presented) The system of claim 28, further comprising:

a snubber located after the mass flow controller to reduce gas turbulence.

30. (previously presented) The system of claim 26, wherein the nozzle orifice has a height H which is larger than a width W.

31. (previously presented) The system of claim 26, wherein:

the nozzle orifice has a height H and a width W; and

a ratio of H to W is between about 2:1 to about 20:1.

32. (previously presented) The system of claim 26, wherein:

the nozzle orifice has a height H and a width W; and

a ratio of H to W is about 10:1.

33. (previously presented) The system of claim 26, wherein:

the reference surface is a flat metal plate on or adjacent a substrate stage that holds a substrate; and

the measurement surface is the substrate stage or the substrate.

34. (previously presented) A method for proximity sensing, comprising:

directing a gas stream into a reference channel and a measurement channel;

restricting flow of the gas stream through the reference channel and the measurement channel;

using nozzles having elongated orifices in probes adjacent respective ends of the reference channel and the measurement channel, wherein the nozzle are proximate to a reference surface and a measurement surface; and

sensing a mass of gas flow between the reference channel and the measurement channel, to thereby determine measurement channel and reference channel standoffs.

35. (previously presented) The method of claim 34, wherein the restricting gas flow step comprises evenly restricting the flow of the gas stream.

36. (previously presented) The method of claim 34, wherein the elongated orifice has a height between about two to about twenty times its width.

37. (previously presented) The method of claim 34, wherein the elongated orifice has a height about ten times its width.

38. (previously presented) The method of claim 34, further comprising:

using a flat metal plate on or adjacent a substrate stage that holds a substrate as the reference surface; and

using the substrate stage or the substrate as the measurement surface.